Crystal Systems

Crystal System	Bravais Type(s)	External Minimum Symmetry	Unit Cell Properties
Triclinc	P	None	a, b, c, al, be, ga,
Monoclinic	P, C	One 2-fold axis, parallel b (b unique)	a, b, c, 90, be, 90
Orthorhombic	P, I, F	Three perpendicular 2-folds	a, b, c, 90, 90, 90
Tetragonal	P, I	One 4-fold axis, parallel c	a, a, c, 90, 90, 90
Trigonal	P, R	One 3-fold axis	a, a, c, 90, 90, 120
Hexagonal	P	One 6-fold axis	a, a, c, 90, 90, 120
Cubic	P, F, I	Four 3-folds along space diagonal	a, a, ,a, 90, 90, 90

Notes :

- Angles alpha, beta , gamma are abbreviated al, be, ga
- Systems right handed (thumb is a, index b, middle finger c)
- Rhombohedral (a, a, a, al, al, al)can be indexed with hexagonal axes (see drawings of Bravais lattices)
- gamma is between lattice vectors a and b
- beta is between lattice vectors a and c
- I is body centered, from german ' INNENZENTRIERT '
- C is the face/plane spanned by lattice vectors a and b.

Crystal System	Bravais Lattice	Unit Cell Dimensions	Required Symm Element
Triclinic	Primitive (P)	$a \neq b \neq c$ $\alpha \neq \beta \neq \gamma$	None
Monoclinic	Primitive (P) Base-Centered (C)	$a \neq b \neq c$ $\alpha = \gamma = 90° \neq \beta$	Either a mirror (plane or a 2-fol
Orthorhombic	Primitive (P) Base-Centered (C) Body-Centered (I) Face-Centered (F)	$a \neq b \neq c$ $\alpha = \beta = \gamma = 90°$	Any combination o mutually ⊥ 2-fold mirror (glide) p
Rhombohedral	Primitive (P)	$a = b = c$ $\alpha = \beta = \gamma \neq 90°$	One 3-fold a
Trigonal	R-Centered (R)	$a = b \neq c$ $\alpha = \beta = 90°$, $\gamma = 120°$	
Hexagonal	Primitive (P)	$a = b \neq c$ $\alpha = \beta = 90° \gamma = 120°$	One 6-fold a
Tetragonal	Primitive (P) Body-Centered (I)	$a = b \neq c$ $\alpha = \beta = \gamma = 90°$	One 4-fold a
Cubic	Primitive (P) Body-Centered (I) Face-Centered (F)	$a = b = c$ $\alpha = \beta = \gamma = 90°$	Four 3-fold a